

C-2351



#### Abstract of the Disclosure

A tubular fuel gas-steam reformer assembly, preferably an autothermal reformer assembly, for use in a fuel cell power plant, includes a fuel-steam vaporizer, a fuel-steam and air mixing station, and a catalyst bed. The catalyst bed can include catalyzed alumina pellets, or a monolith such as a foam or honeycomb body which is preferably formed from a high temperature material such as a steel alloy, or from a ceramic material. The fuel-steam mixture is vaporized in the vaporizer and then passes into the mixing station. The mixing station comprises a plurality of mixing tubes which open into the catalyst bed. The mixing tubes extend through a manifold and include openings which interconnect the interior of the tubes with the manifold. The openings have axes which are perpendicular to the axis of each of the mixing tubes, and are positioned on the tubes at locations which are dictated by the diameter of the mixing tubes and which will ensure thorough mixing of the air and fuel-steam streams. A preferred mode of operation involves introducing the fuel-steam stream into the mixing tubes from the vaporizer and feeding the air into the manifold. The  $\Delta p$  between the air supply and the fuel-steam stream is relatively small.

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